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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,107	10/10/2003	John H. Jenkins	133865	2757

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Patrick Rasche
Armstrong Teasdale LLP
Suite 2600
One Metropolitan Square
St. Louis, MO 63102

EXAMINER	
RAMIREZ, JOHN FERNANDO	

ART UNIT	PAPER NUMBER
3737	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/684,107	**Applicant(s)** JENKINS ET AL.	
	Examiner JOHN F. RAMIREZ	**Art Unit** 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 02/03/09.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/03/09 has been entered.

Response to Amendment

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 8-12 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over J. Christiaens et al. *"ECG-Based Selection of Angiographic Images using DICOM Facilities"* in view of Byrd et al. (US 7,314,446).

J. Christiaens et al. discloses a method for analyzing stored DICOM angiographic sequences of image data and ECG data obtained during a study of a patient during a plurality of cardiac cycles (see Abstract, see Introduction), said imaging data comprising, data enhanced by injection of a contrast agent into the cardiovascular system of the patient (see abstract); frames representative of a succession of images of the patient's heart (see section R-peak detection); analyzing the stored physiologic data to determine times of a selected phase in the plurality of cardiac cycles (see section: R-peak detection); select, in the plurality of cardiac cycles, stored images corresponding to the determined times of the selected phase (see the selection of the images section); and align and average images corresponding to the selected phase across the plurality of cardiac cycles (see section: R-peak detection and see section: the selection of images; Note: In the pre-processing step the images are aligned because they are selected out corresponding with the same R-peak occurred in the corresponding ECG. This is done using the synchronization properties between the image sequences and the ECG sequences.) to produce a single representative frame of image data (see sections: the selection of the images and the display of the selected images).

J. Christiaens et al. does not expressly states that the imaging data and the physiologic data (ECG) are time-stamped. However, in the same field of endeavor, Byrd et al. teaches a medical imaging system that obtain a trigger signal corresponding to a timing, imaging equipment configured to obtain images of the feature of interest and a workstation with a processor programmed to correlate or synchronize the stored images with the trigger signals (ECG). (see FIGS. 1 and 4, col. 1, lines 55-67; col. 2, lines 1-16; col. 3, lines 40-50; col. 4 , lines 36-39; col. 6, lines 50-67; col. 7, lines 1-4). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify J. Christiaens et al. method for analyzing images, by incorporating, the use of time-stamp the image data and the physiological data as taught by Byrd et al. Such a modification would provide a more accurate synchronization to match and image with the corresponding time-sample in the waveform signals.

Claims 2-7 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over J. Christiaens et al. *"ECG-Based Selection of Angiographic Images using DICOM Facilities"* in view of Byrd et al. (US 7,314,446) in further view of Manning et al. (US 6,501, 979), or Ossmann et al. (US 2004/0092816).

J. Christiaens et al. and Byrd et al. as set forth above disclose a method for analyzing stored frames of time-stamped imaging data and time-stamped physiologic data obtained during a study of a patient during a plurality of cardiac cycles, except for mentioning specifically the steps of determining both a systolic volume and a diastolic volume, and determining an ejection fraction. However, the steps of filtering non-left ventricle anatomy from the single representative frame of image data, to detect edges of a left ventricle wall in the filtered, to determine both a systolic volume and a diastolic volume, and determining an ejection fraction, are conventional in the art as evidenced by the teachings of Manning et al. (US 6,501, 979), Ossmann et al. (US 2004/0092816).

Based on the above observations, for a person of ordinary skill in the art, modifying J. Christiaens et al. with a computer to filter non-left ventricle anatomy from the single representative frame of image data, to detect edges of a left ventricle wall in the filtered, to determine both a systolic volume and a diastolic volume, and determining an ejection fraction, would have been considered obvious in view of the proven conventionality of these enhancements.

With respect to claims 2 and 3, J. Christiaens et al. discloses a complete recording session of an angiographic sequence including images of the left ventricle in which each angiographic sequence contains an image sequence and a simultaneously recorded ECG sequence. In this way, the sequences and ECG signals are filtered to detect R-peaks during the recording of the sequence for display (see figures 2, 6, 7 and related description). Therefore, it would have been obvious to one having an ordinary skill in the art at the time of the invention was made to apply the above enhancements to J. Christiaens' method to derive the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN F. RAMIREZ whose telephone number is (571)272-8685. The examiner can normally be reached on (Mon-Fri) 7:00 - 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN CASLER/
Supervisory Patent Examiner, Art Unit 3737

/J. F. R./
Examiner, Art Unit 3737